

## Tevatron collider progress: January to early March 2002

I. Luminosity: → early Jan (stores #874-889)

Average initial peak  $L=7.62$

→ early Mar (stores #1036-1045)

Average initial peak  $L=10.24$

or 34% increase =

+30% due to  $p\bar{p}$  trsf improvement

+30% due to larger p-intensity

-30% in effective emittance

II. Reliability: → no major component failures

→ late Dec-mid Jan TeV suffered from quenches during abort and spiky losses at B0

→ spikes and quenches are eliminated by TEL and in part disappeared naturally

→ it was DC beam due to long emitt growth

→ RF noise is thought to be the reason

### III. Technical progress:

- Longitudinal mode-0 and quadrupole dampers are operational, multimode is coming
- A150 line found ~OK, tight  $\phi$  aperture on inj helix, some progress in opening the aperture
- 20% loss rate reduction by collimators, progress in proton removal
- TEL is back to better lifetimes (still far from the goal, better understanding)
- Diagnostics: FWires are better, new chromaticity measmnt technique, FBI calibration

### IV. Issues:

- $p$ ,  $pbar$  lifetime @ 150 GeV
- $pbar$  loss during squeeze
- losses @ CDF
- transverse and longitudinal stability
- diagnostics (Jim to report next Fri)

## V. Expectations:

p, pbar lifetime @ 150 GeV improved in 3 months  
(open aperture, correct tunes&coupling, feeddowns for pbars)  
→ some 10-15% improvement in luminosity (at current intensities)

pbar loss at Seq.13 reduced (the first attempt) in 2 months  
(optimized separators, parsing squeeze, feeddowns for pbars)  
→ some 20% improvement in luminosity (at current intensities)

pbar emittance and intensity improved in 2-3 months  
(pbar source optimization, MI transfer)  
→ some 20% improvement in luminosity

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**Luminosity of  $2e31$  in May-June 2002**

SyncLite, SBD, orbit oscillations detector in 3 months